

# 3M

# Scotch-Weld™

## Structural Adhesive Film

### AF 3185

#### Technical Data

Issue No. 1

#### Introduction

3M™ Scotch-Weld™ Structural Adhesive AF 3185 film is a non-volatile, thermosetting epoxy laminating adhesive and glass cloth combination designed for the structural bonding and for the preparation of reinforced epoxy glass laminate. Scotch-Weld AF 3185 film is commonly used for bonding aircraft canopies and windscreens into frames. Scotch-Weld AF 3185 film has been extensively used for bonding printed circuit boards to backing plates in the electronics industry.

#### Advantages

- Cure temperatures as low as 200°F (93°C) may be used.
- Easy to cut.
- Very low flow (< 10%).
- Repositionable.
- Excellent for vacuum or low pressure curing.
- Excellent for bonding glass.

#### Note

The technical information and data included in this technical data sheet should be considered representative or typical only and should not be used for specification purposes.

#### Product Description

<b>Form:</b>	Style 108 glass cloth preimpregnated with toughened epoxy resin
<b>Color:</b>	Light Tan
<b>Weight:</b>	0.050 ± .01 lb./ft. <sup>2</sup> (245 ± 50 g/m <sup>2</sup> )
<b>Caliper:</b>	8 mils

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## Mechanical Performance

### Overlap Shear

75°F	4600 psi	31.7 MPa
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ASTM D 1002

Metal: FPL etched 2024-T3 bare aluminum

Cure cycle: 200 ± 5°F - 12 to 15 psig - 6 hours - 9°F/minute rise rate

Test load rate: 1200-1400 psi/minute (0.05 inches/minute)

### Metal to Metal Climbing Drum Peel

Test Temp	Peel Rate	Peel Strength
75°F	1"/min	41 in lb/in
75°F	3"/min	47 in lb/in

ASTM D 1781

Metal: FPL etched 2024-T3 clad aluminum

Cure cycle: 235 ± 5°F - 35 psig - 90 minutes - 5°F/minute rise rate

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## Application

Proper application is as important as proper design and laminating adhesive choice to obtain maximum laminate properties. Improper laminating techniques can result in partial or complete failure of an assembly.

### Laminate Preparation:

#### Laminate Lay-up:

1. Cut portion of film to be used with protective liner in place.
2. Place film on part.
3. Roll in place with rubber roller. Heating film slightly will increase its tackiness.
4. Remove protective liner.
5. Repeat procedure until the desired number of plies are obtained.

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#### Cure Cycle

##### A. General Cure Requirements

The cure requirements for Scotch-Weld AF 3185 film are a function of Scotch-Weld AF 3185 film properties. Specific application, equipment available, production limitations and bond properties required. General cure properties of Scotch-Weld AF 3185 film are as follows:

1. Cure Pressure:

Pressure is required during cure to form a high strength bond. Pressure may be applied by use of an autoclave, press, or vacuum bag.

2. Cure Temperature:

The cure temperature may be varied from 200°F to 350°F (93°C to 177°C) depending upon the materials being used, equipment available and properties desired. Scotch-Weld AF 3185 film will soften as temperature is increased and cure will be initiated at 200°F (93°C) and a low strength gel formed. Continued heating chemically converts this gel into a high strength, solvent resistance bondline.

3. Cure Time:

Cure time depends upon the cure temperature used, methods heat application, production limitations and bond properties required. Since no two operations are exactly alike, it is recommend that a few simple experiments be conducted varying both temperature and cure time to determine optimum conditions for the particular application.

##### B. Suggested Cure Cycle

The following cure cycle has been used to obtain high strength bonds in our laboratory.

1. Apply a positive pressure of 25 psi (0.17 MPa) and maintain throughout the cure cycle.
2. Raise the temperature from ambient to 250°F (121°C) at a 5°F/minute rise rate (2.8°C/minute rise).
3. Cure for 60 minutes at 250°F (121°C).
4. Cool to below 100°F (38°C) prior to release of positive pressure.

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#### Storage

Scotch-Weld AF 3185 film must be stored at 0°F (-18°C) for lower. It should be permitted to warm thoroughly to room temperature before using to prevent moisture condensation.

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#### Shelf Life

When stored at 0°F (-18°C) or below, the 3M Standard shelf life for Scotch-Weld AF 3185 film is 6 months from date of shipment from 3M.

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**Precautionary Information** Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

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**For Additional Information** To request additional product information or to arrange for sales assistance, call toll free (800) 235-2376. Our fax number is (417) 869-5219. Address correspondence to: 3M Aerospace Central, 3211 E. Chestnut Expressway, Springfield, MO 65802.

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This Adhesives Division product was manufactured under a 3M quality system registered to ISO 9002 standards.



#### Adhesives Division

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